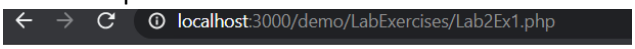
IDG2003 – Lab2

Exercise 1 : - Strings and dynamic text

1. Create 4 variables for a basic notification system, which should store the following information :
    a. Username
    b. Number of notifications
    c. Number of emails
    d. String that says “You have X notifications”; (X updates dynamically based on number of notifications.
2. Within H1 heading of html, display a welcome message that greets the user by name, based on the content of the username variable created in part 1.
3. Within <?php ?> tags, this time – Display the string created in 1(d) but also append additional text that also lists the number of emails. Of course, the number of emails should also dynamically update based on the variable in 1(c). This time display within H2 heading tags of html.

    Results expected :



Welcome Maria!

You have 10 notifications and 8 emails!

4. Change the content of username, notification and emails number and refresh the page to see if the message displayed are updated dynamically.
    To help you get started :

```
<!DOCTYPE html>
<html lang="en">
<head>
    <meta charset="UTF-8">
    <title>Document</title>
</head>
<body>

    <?php
    // Ex1, part 1, declare your variables here


    ?>

    <!-- Ex1, part 2, Display welcome text in html
    tags -->


    <?php
    // Ex1, part 3, Display secondary text within
    php tags, with H2 heading tags.

    ?>

</body>
</html>
```

Exercise 2 : - Playing around with arrays, functions and equations : Planets Info.

Main Task : Create a simple page containing a table that populates data based on planet data in the Solar System and uses that data to calculate additional information such as surface gravity and escape velocities for each planet. Simple functions can be written and called for these simple calculations.

(A skeletal php script has been provided to help you get started)

https://www.theplanetstoday.com/planets_information_basic_facts.html

Names	Diameter(km)	Mass(10^{24} kg)
Mercury	4879	0.330
Venus	12104	4.87
Earth	12756	5.97
Mars	6792	0.642
Jupiter	142984	1898
Saturn	120536	568
Uranus	51118	86.8
Neptune	49528	102

1. Create a variable (G) containing the value for the gravitational constant (6.674 E-11).
2. Create a two dimensional array of (dimension 8x3 : 8 rows, 3 columns) to store the planet information, as listed in the table above. Your array should be in the following format:

Mercury	4879	0.330
Venus	12104	4.87
Earth	12756	5.97
.	.	.
.	.	.
.	.	.

3. Write 2 functions. One for calculating surface gravity, g and the other for calculating escape velocity, v_e. Both functions should take only 2 arguments: the Mass and Diameter of the planets. You should access the global variable G from inside of each function.

   Formula for surface gravity :

   $g = GM/r^2$
   $where\ M\ is\ the\ mass\ of\ the\ planet$
   $r\ is\ the\ radius\ of\ the\ planet.$
   G is the gravitational constant

   Formula for escape velocity :

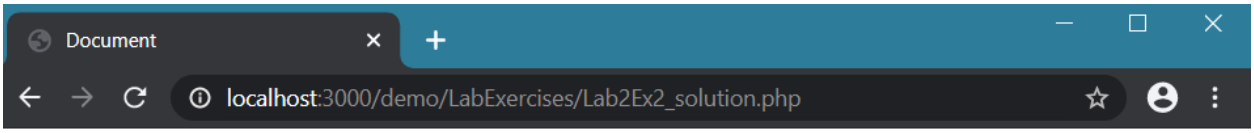
$$v_e = \sqrt{\frac{2GM}{r}}$$

Bear in mind:

i. The value for diameter should be halved to obtain the radius. Also note that the formulae given take SI units. Meaning the value for r should be converted from km to m first.
ii. The value for mass is given in exponential form and must therefore be multiplied by 10^{24}.

4. In the main body of your script, create a table in HTML format, where you populate each row with the data from the two dimensional array created in part 2. Create 2 additional entries per row for surface gravity and escape velocity of each planet. Call the functions created part 3. Where you pass the relevant mass and diameter values for each planet to obtain their respective gravity and escape velocities.
(Refer to https://www.w3schools.com/html/html_tables.asp)

Expected Result :



Planets in the Solar System

Names	Diameter(km)	Mass(10^{24} kg)	Gravity(m/s^2)	Escape Velocity(km/s)
Mercury	4879	0.33	3.7	4.25
Venus	12104	4.87	8.9	10.36
Earth	12756	5.97	9.8	11.18
Mars	6792	0.642	3.7	5.02
Jupiter	142984	1898	24.8	59.53
Saturn	120536	568	10.4	35.47
Uranus	51118	86.8	8.9	21.29
Neptune	49528	102	11.1	23.45